

## Neotropical Monogenoidea. 27. Two New Species of *Telethecium* gen. n. from the Nasal Cavities of Central Amazonian Fishes and a Redescription of *Kritskyia moraveci* Kohn, 1990 (Dactylogyridae, Ancyrocephalinae)

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**ABSTRACT:** Two new species of Dactylogyridae (Ancyrocephalinae) are described from the nasal cavities of Central Amazonian fishes (Brazil): *Telethecium nasalis* sp. n. from *Osteoglossum bicirrhosum* Vandelli (Osteoglossidae), Furo do Catalão, near Manaus, Amazonas; and *T. paniculum* sp. n. from *Pellona flavipinnis* (Valenciennes) (Clupeidae), Rio Solimões, Ilha da Marchantaria, Manaus, Amazonas. *Telethecium* gen. n. is proposed for species having the terminal male genitalia located within a bag protruding from the midventral surface of the anterior trunk, a haptor armed with 14 hooks (12 marginal, 2 subcentral), overlapping gonads, a sinistrolateral vaginal aperture, a coiled male copulatory organ with counterclockwise rings, and a cephalic area lacking well-defined cephalic lobes; anchors, bars and 4A's are absent. *Kritskyia moraveci* Kohn, 1990, from the urinary tract of *Rhamdia quelen* (Quoy and Gaimard) (Pimelodidae) is redescribed. An emended diagnosis of *Kritskyia* Kohn, 1990, is provided.

**KEY WORDS:** Brazil, Monogenoidea, Dactylogyridae, *Telethecium* gen. n., *Telethecium nasalis* sp. n., *Telethecium paniculum* sp. n., *Kritskyia moraveci*, *Osteoglossum bicirrhosum*, *Pellona flavipinnis*, *Rhamdia quelen*.

Monogenoideans from sites other than the gills and skin of fishes have been infrequently studied with a few species recorded from nasal cavities, urinary and digestive systems, and lateral line pits of these hosts. In the Neotropics, only *Rhinoxenus* Kritsky, Boeger, and Thatcher, 1988 (with 4 species), and *Rhinonastes* Kritsky, Thatcher, and Boeger, 1988 (monotypic), have been proposed to accommodate species from the nasal cavities of freshwater fishes (Kritsky et al., 1988a, b; Boeger et al., 1995). Kohn (1990) proposed the monotypic *Kritskyia* for a species from the urinary bladder and ureters of a siluriform fish in Brazil. Although phylogenetic relationships are unknown, it appears that monogenoideans from sites other than the gills and skin form a unique fauna within the Neotropics. In the present paper, *Telethecium* gen. n. is proposed for 2 new species from the nasal cavities of distantly related hosts in the Brazilian Amazon. *Kritskyia moraveci* Kohn, 1990, is redescribed.

### Materials and Methods

Hosts, *Osteoglossum bicirrhosum* Vandelli (Osteoglossidae) and *Pellona flavipinnis* (Valenciennes) (Clupeidae), were collected with nets from the environs of

Manaus, Amazonas, Brazil, during 1984–1989. Methods of parasite collection and preparation of the helminths for study, measurement, and drawing are those of Kritsky et al. (1988a). Measurements (in micrometers) include the average followed by the range and number of structures measured in parentheses. Type specimens and vouchers are deposited in the collections of the Instituto Oswaldo Cruz, Rio de Janeiro, Brazil (IOC), the United States National Parasite Collection, Beltsville, Maryland (USNPC), and the University of Nebraska State Museum, Lincoln, Nebraska (HWML).

### Results

#### *Telethecium* gen. n.

**DIAGNOSIS:** Dactylogyridae: Ancyrocephalinae. Body fusiform, comprising cephalic region, trunk, peduncle, haptor. Tegument thin, smooth. Cephalic lobes undifferentiated, head organs present, cephalic glands indistinct. Eyes 4; granules elongate ovate. Mouth midventral; pharynx muscular, glandular; esophagus present; intestinal ceca (2) confluent in posterior trunk, lacking diverticula. Gonads overlapping, intercecal; testis dorsal to germarium. Vas deferens looping left intestinal cecum; seminal vesicle a dilation of vas deferens; 1 prostatic reservoir. Male cop-

ulatory organ consisting of sclerotized coiled tube with counterclockwise rings (Kritsky et al., 1985); accessory piece articulated to cirral base, membranous, bipartite, with distal portion serving as guide for male copulatory organ; copulatory complex (male copulatory organ + accessory piece) lying within bag that protrudes from anteroventral surface of trunk. Vaginal aperture sinistrolateral; seminal receptacle anterior to germarium; uterus indistinct; genital pore midventral. Vitellaria coextensive with intestinal ceca. Haptor posteroventrally concave, with 14 hooks (12 submarginal, 2 subcentral); 1 hook may be absent in some specimens. Anchors, bars, 4A's absent. Parasites of the nasal cavities of freshwater Neotropical fishes.

**TYPE SPECIES:** *Telethecium nasalis* sp. n. from *Osteoglossum bicirrhosum* Vandelli (Osteoglossidae).

**OTHER SPECIES:** *Telethecium paniculum* sp. n. from *Pellona flavipinnis* (Valenciennes) (Clupeidae).

**ETYMOLOGY:** The generic name is from Greek (*tele* = far, far off + *theco* = a case for something) and refers to the protruding bag containing the terminal male genitalia.

***Telethecium nasalis* sp. n.**  
(Figs. 1–5)

**HOST AND LOCALITY:** Nasal cavity of *Osteoglossum bicirrhosum* Vandelli (Osteoglossidae); Furo do Catalão, near Manaus, Amazonas, Brazil (10 January 1989).

**SPECIMENS STUDIED:** Holotype, IOC 33.639; 17 paratypes, USNPC 84842, HWML 38345.

**DESCRIPTION:** Body 306 (267–332;  $N = 10$ ) long; greatest width 95 (84–105;  $N = 5$ ) near midlength; cephalic region narrow. Eyes equidistant; members of posterior pair larger than those of anterior pair; eye granules small; accessory granules absent to numerous in cephalic region. Pharynx spherical, 21 (20–22;  $N = 5$ ) in diameter; esophagus short. Peduncle indistinct; haptor 32 (30–35;  $N = 5$ ) long, 51 (48–58;  $N = 5$ ) wide. Hooks 20 (19–21;  $N = 23$ ) long, similar; each with slightly protruding broad thumb, delicate point, shank comprised of 2 subunits; proximal subunit expanded; FH loop  $\frac{1}{2}$  shank length;

1 hook frequently absent with FH loop remaining (8 of 18 specimens with 13 hooks) (Fig. 1). Male copulatory organ with about 1.5 rings; base of male copulatory organ with variable sclerotized margin; male copulatory organ 82 (75–88;  $N = 4$ ) long, proximal ring diameter 19 (17–20;  $N = 10$ ). Accessory piece 26 (23–30;  $N = 10$ ) long, pincer-shaped. Gonads ovate; testis 44 (37–53;  $N = 5$ ) long, 26 (22–30;  $N = 3$ ) wide; seminal vesicle C-shaped, with delicate wall; prostatic reservoir saccate. Germarium 55 (50–67;  $N = 4$ ) long, 32 (30–33;  $N = 3$ ) wide; oviduct, ootype, uterus not observed. Vagina with sclerotized surface plate, distal sclerotized canal funnel-shaped, opening into large seminal receptacle.

**REMARKS:** *Telethecium nasalis* is the type species for the genus. It differs from its congener by having a larger accessory piece, a structurally complex vaginal aperture, and slightly protruding hook thumbs. In *T. paniculum*, the hook thumbs are depressed, the sclerotized vaginal aperture is simple, and the accessory piece lacks a pincer shape.

**ETYMOLOGY:** The specific name is from Latin (*nas/o* = the nose + *-alis* = pertaining to) and refers to the site of infestation on its host.

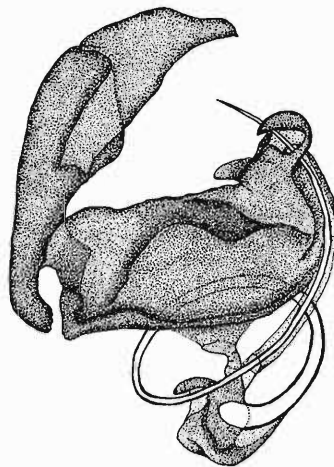
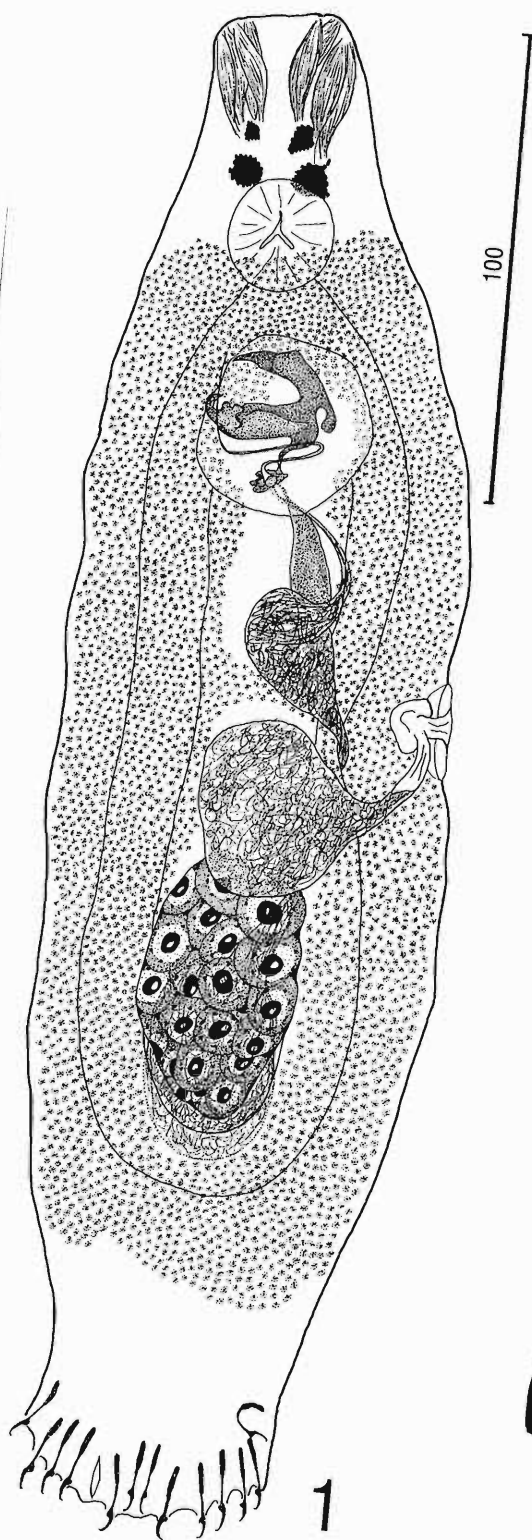
***Telethecium paniculum* sp. n.**  
(Figs. 6–9)

**HOST AND LOCALITY:** Nasal cavity of *Pellona flavipinnis* (Valenciennes) (Clupeidae); Rio Solimões, Ilha da Marchantaria, near Manaus, Amazonas, Brazil (14 September 1984).

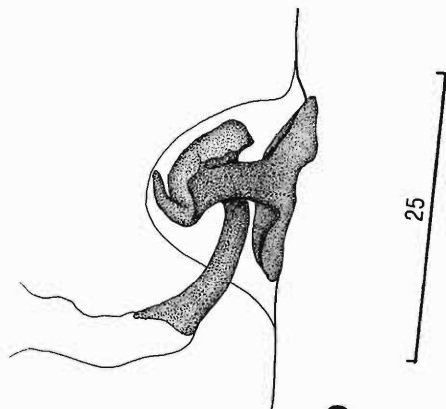
**SPECIMENS STUDIED:** Holotype, IOC 33.640; 4 paratypes, USNPC 84843, HWML 38344.

**DESCRIPTION:** Body 287 (276–297;  $N = 2$ ) long, conical; greatest width 87 (77–94;  $N = 3$ ) in posterior trunk. Cephalic margin narrow, tapered anteriorly. Eyes equidistant, compact; members of posterior pair larger than those of anterior pair; eye granules small; accessory granules uncommon in cephalic, anterior trunk regions. Pharynx subspherical, 23 (22–24;  $N = 3$ ) in diameter; esophagus short. Peduncle broad; haptor 42 (41–45;  $N = 3$ ) long, 71–72 ( $N = 2$ ) wide. Hooks 19 (18–20;  $N = 6$ ) long, similar; each with depressed thumb, delicate point, shank comprised of 2 subunits; proximal subunit ex-

Figures 1–5. *Telethecium nasalis* gen. et sp. n. 1. Holotype (ventral view; note that 1 haptoral hook in this specimen has been lost but the FH loop remains). 2. Copulatory complex. 3. Vagina. 4. Hook. 5. Lateral view of specimen showing relationship of body and copulatory bag (scale not provided). Figure 1 is drawn to the 100- $\mu$ m scale; Figures 2–4 are drawn to the 25- $\mu$ m scale.



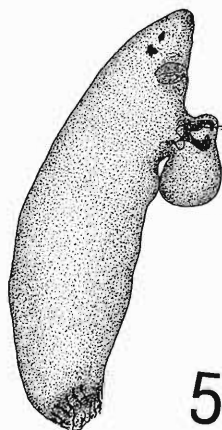
2



3



4



5



panded; FH loop  $\frac{1}{2}$  shank length. Male copulatory organ with about 1.5 rings; base of male copulatory organ with wide sclerotized margin; male copulatory organ 90 (85–95;  $N = 2$ ) long, proximal ring diameter 17 (16–18;  $N = 4$ ). Accessory piece 17 (16–19;  $N = 3$ ) long, variable, distally bifurcate. Testis 39 (33–44;  $N = 2$ ) long, 26 (21–31;  $N = 2$ ) wide, ovate; seminal vesicle a loop of vas deferens; prostatic reservoir saccate, pyriform. Germarium bacilliform, 61 (53–68;  $N = 2$ ) long, 21 ( $N = 2$ ) wide; oviduct, ootype, uterus not observed. Vagina distally funnel-shaped with anteromedial lip; vaginal canal opening into large seminal receptacle.

REMARKS: *Telethecium paniculum* sp. n. is distinguished from *T. nasalis* by having the vaginal aperture anterior to the midlength of the body, a smaller accessory piece, and by the comparative morphology of the vaginae.

ETYMOLOGY: The specific name is from Latin (*panicula* = a small swelling) and refers to the midventral bag containing the terminal male genitalia.

#### *Kritskyia* Kohn, 1990

EMENDED DIAGNOSIS: Dactylogyridae: Ancyrocephalinae. Body elongate, fusiform, divisible into cephalic region, trunk, peduncle, haptor. Tegument thin, smooth. Cephalic lobes undifferentiated, head organs inconspicuous, cephalic glands indistinct. Eyes variable, comprising 4–6 accumulations of elongate-ovate granules. Mouth midventral at level of anterior margin of pharynx; pharynx muscular, glandular; esophagus present; intestinal ceca (2) confluent in posterior trunk, lacking diverticula. Gonads apparently tandem, intercecal; testis postgerminal. Vas deferens looping left intestinal cecum; seminal vesicle a dilation of vas deferens; 2 prostatic reservoirs. Male copulatory organ consisting of sclerotized coiled tube with counterclockwise rings (Kritsky et al., 1985); accessory piece non-articulated to base of male copulatory organ, membranous. Vaginal aperture sinistral in anterior trunk; seminal receptacle sinistral to anterior end of germarium; uterus indistinct; genital pore midventral. Vitellaria coextensive with intestinal ceca. Haptor cup-shaped, lacking anterior rim, armed with 14 marginal hooks. An-

chors, bars, 4A's absent. Parasites from urinary bladders and ureters of freshwater Neotropical fishes.

TYPE SPECIES: *Kritskyia moraveci* Kohn, 1990, from *Rhamdia quelen* (Quoy and Gaimard) (Pimelodidae).

#### *Kritskyia moraveci* Kohn, 1990 (Figs. 10–13)

HOST AND LOCALITY: Urinary bladder and ureters of *Rhamdia quelen* (Quoy and Gaimard) (Pimelodidae); Hydroelectric Power Station reservoir of "Passo Fundo," Rio Passo Fundo, São Valentim, Rio Grande do Sul, Brazil (May 1985).

SPECIMENS STUDIED: Three vouchers, USNPC 84844, HWML 38343.

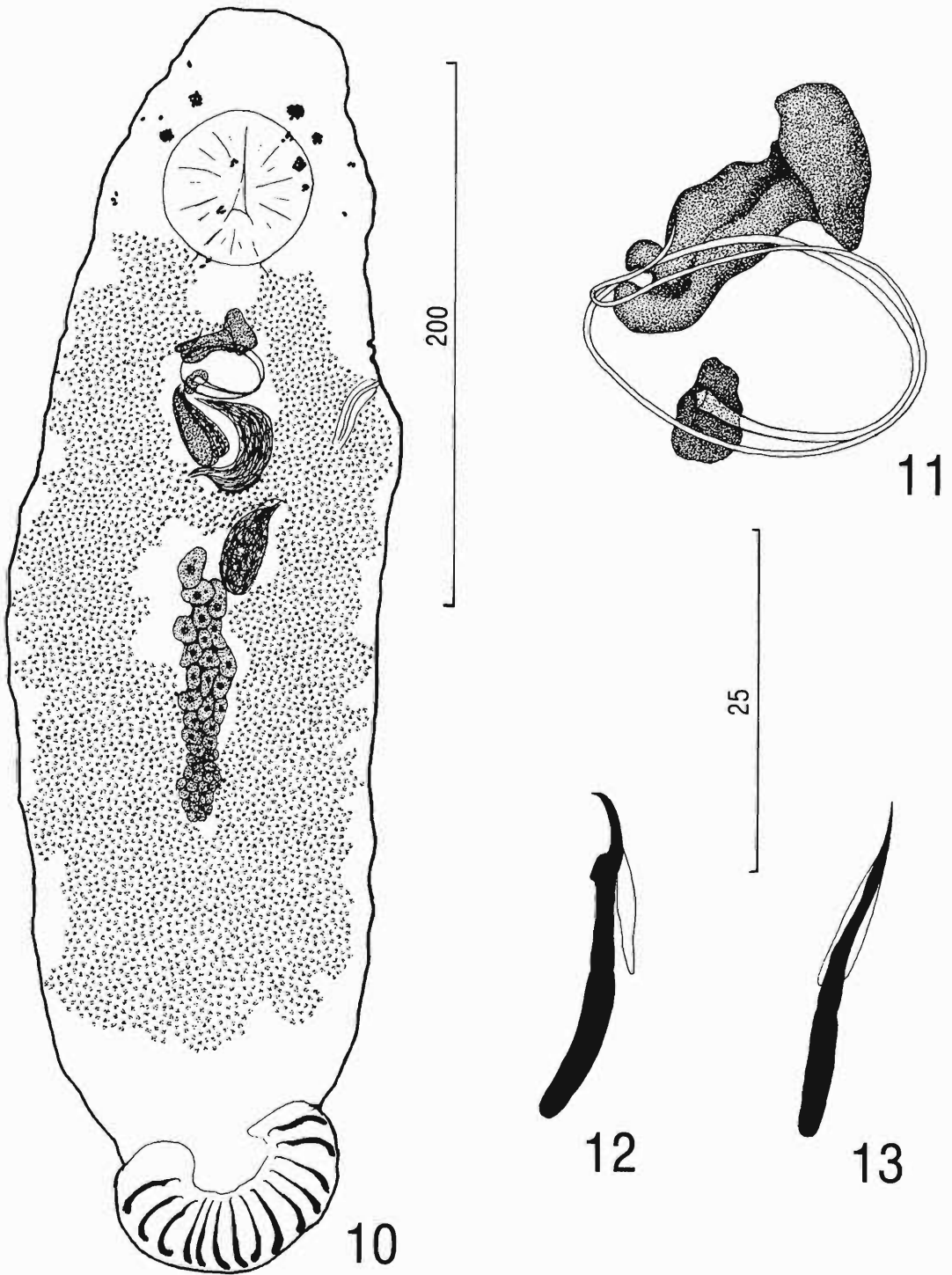
REDESCRIPTION: Body 438 (409–466;  $N = 2$ ) long; greatest width 150 (141–159;  $N = 2$ ) near midlength or in anterior trunk. Cephalic margin broad. Eyes subequal, lying dorsal to anterior margin of pharynx; accessory granules common in cephalic, anterior trunk regions. Pharynx spherical, 49 (48–50;  $N = 2$ ) in diameter; esophagus short. Peduncle broad; haptor 58 (56–59;  $N = 2$ ) long, 89 (84–94;  $N = 2$ ) wide. Hooks similar, 25–26 ( $N = 9$ ) long; each with flattened thumb, delicate point, expanded shank comprised of 2 subunits; FH loop  $\frac{1}{2}$  shank length. Male copulatory organ 143 (128–158;  $N = 2$ ) long, a loose coil of about 2 rings; base of male copulatory organ with sclerotized marginal flap; proximal ring diameter 28 (23–33;  $N = 2$ ). Accessory piece 28 (24–33;  $N = 3$ ) long, comprising variable grooved sheath. Testis not observed; seminal vesicle with delicate wall, C- or S-shaped; prostatic reservoirs saccate. Germarium with irregular margin, 73 (68–79;  $N = 2$ ) long, 30 (27–33;  $N = 2$ ) wide; oviduct, ootype, uterus not observed; vagina lightly sclerotized, opening into fusiform seminal receptacle.

REMARKS: The vouchers on which this redescription is based were collected from the same host specimens from which the type series for the species was obtained. We are grateful to Dr. A. Kohn for kindly providing them.

Kohn (1990) reported the accessory piece of the copulatory complex to be bipartite. In present specimens, the accessory piece is sheathlike with a longitudinal groove and a recurved (fold-

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Figures 6–9. *Telethecium paniculum* gen. et sp. n. 6. Holotype (ventral view). 7. Copulatory complex. 8. Vagina. 9. Hook. All figures are drawn to the 25- $\mu$ m scale except Figure 6 (100  $\mu$ m).



Figures 10–13. *Kritskyia moravecii* Kohn, 1990. 10. Whole mount (ventral view). 11. Copulatory complex. 12. Hook (lateral view). 13. Hook (ventral view). All figures are drawn to the 25- $\mu$ m scale except Figure 10 (200  $\mu$ m).

ed) distal end. The distal fold is apparently the structure corresponding to the second portion of the accessory piece described by Kohn (1990).

Tandem gonads could not be confirmed in present specimens. A discrete cellular body occurred immediately posterior to the germarium. This body may be the testis, although no sperm cells could be seen and the origin of the vas deferens was not apparent.

### Discussion

Although species of *Telethecium* and *Kritskyia* inhabit different organs of their respective hosts, it appears that these genera may be closely related. Morphological characteristics supporting this relationship include the general organization of internal organ systems; presence of truncate cephalic margins; counterclockwise, loosely coiled male copulatory organs; sinistral vaginal apertures; and haptors lacking anchors, bars, and 4A's. These genera are differentiated by position of the gonads (overlapping in *Telethecium*; tandem in *Kritskyia*), presence of a midventral bag protruding from the anterior trunk and containing the terminal male genitalia in *Telethecium* (absent in *Kritskyia*), and morphology of the haptor (a simple posterior extension of the body armed with 14 hooks [12 marginal, 2 subcentral] in *Telethecium*; cup-shaped without an anterior rim and armed with 14 marginal hooks in *Kritskyia*).

Kohn (1990) included *Kritskyia* along with *Acolpenteron* Fischthal and Allison, 1940, and *Anonchohaptor* Mueller, 1938, in an unnamed group of primitive Monogeneoidea based on presence of all haptoral hooks being marginal and absence of haptoral anchors and bars. This group is clearly polyphyletic, with its members representing 3 different familial taxa: *Kritskyia* (Ancyrocephalinae), *Acolpenteron* (Dactylogyridae), and *Anonchohaptor* (Pseudomurraytremae). In their analysis of character evolution within the Monogeneoidea, Boeger and Kritsky (1993) considered presence of a bar a symplesiomorphy

for the Dactylogyridea, presence of anchors in at least 1 developmental (life cycle) stage a synapomorphy for the Monogeneoidea, and 14 hooks marginal in the haptor a derived state resulting from loss of 1 hook pair from the plesiomorphic "16 marginal" state. If character evolution proceeded according to that suggested by Boeger and Kritsky (1993), both *Kritskyia* and *Telethecium* are clearly derived taxa that express secondary loss of anchors, 1 hook pair, and bars.

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